

Study programme: BSc in Biology			
Level: Bachelor degree			
Course title: Cell and Tissue Culture			
Lecturer: dr Edward Petri, dr Jelena Markovic			
Status: elective			
ECTS: 6			
Requirements: -			
Learning objectives			
The aim of the course is to provide students with basic theoretical knowledge and practical experience in the field of cell culture propagation, the establishment of primary cultures, and the applications of cell and tissue culture in molecular biology and biomedical research.			
Learning outcomes			
After successful course completion, students will have acquired basic knowledge and experience necessary for experimental work with cell cultures, which will facilitate research work in laboratories of different profiles.			
Syllabus			
<i>Theoretical instruction</i>			
The concept of tissue culture. Types of tissue culture. Techniques for performing aseptic work. Establishment of primary culture, isolation and cell selection, cell culture propagation, transformation and immortalization, cloning and selection of specific cell types. Cell growth media, subculture, freezing and defrosting of cells. Viability tests (color rejection test, color import test, LDH release, MTT essay, AmalarBlue essay). Tests for measuring cell proliferation, growth curves. Heterologous expression of proteins in cell cultures. Application of cell cultures in molecular biology. Application of cell cultures in medical research, biotechnology and industry.			
<i>Practical instruction</i>			
Introduction to laboratory equipment and conditions necessary for cell and tissue culture work. Aseptic techniques. Cell counting, determination of cell concentrations. Supplementation of cell lines. Freezing and defrosting cell lines. Determination of cell viability. Measurement of proliferation of cells with a colorimetric test with tetrasolium salts. Determination of cytotoxic activity with a colorimetric test.			
Literature			
1. Freshney RI (2010) Culture of animal cells: a manual of basic technique and specialized applications, 6th ed. Wiley-Blackwell.			
2. Mather JP, Roberts PE (1998) Introduction to Cell and Tissue Culture: Theory and Technique. Biomedical and Life Sciences.			
3. Celis JE (2006) Cell Biology: A Laboratory Handbook, 3rd ed. Elsevier Inc.			
Weekly teaching load			Other:
Lectures: 2	Exercises: 2	Other forms of teaching:	
Teaching methodology			
Grading method (maximal number of points 100)			
Pre-exam obligations	points	Final exam	points
Colloquia	15	Oral exam	30
Seminar	20	Written exam	30
attendance	5	(other)	